

What is claimed is:

1. An isolated cyanobacterium comprising a portion of an exogenous bacterial cellulose operon sufficient to express bacterial cellulose, whereby the cyanobacterium produces extracellular glucose.

2. The cyanobacterium of claim 1, wherein the cyanobacteria is further defined as producing extracellular glucose and cellulose in the form of monosaccharides, disaccharides, oligosaccharides or polysaccharides from photosynthesis.

3. The cyanobacterium of claim 1, wherein the cyanobacteria is further defined as making monosaccharides, disaccharides, oligosaccharides or polysaccharides that comprise glucose and cellulose.

4. The cyanobacterium of claim 1, wherein the cyanobacterium comprises *Synechococcus* sp. PCC 7002, *Synechococcus leopoliensis* strain UTCC 100, *Agmenellum quadruplicatum* UTEX B2268, *Nostoc* spp., *Anabaena* spp., *Cyanothece* spp., *Trichodesmium* spp. and *Synechococcus* sp. ATCC 27264.

5. The cyanobacterium of claim 1, wherein the glucose, the cyanobacterial extracellular polysaccharides or both are further processed as a renewable feedstock for biofuel production.

6. The cyanobacterium of claim 1, wherein the cyanobacterium can fix CO₂ while producing cellulose and reducing atmospheric CO₂.

7. The cyanobacterium of claim 1, wherein the cyanobacterium increases the extracellular production of monosaccharides, disaccharides, oligosaccharides or polysaccharides upon exposure to acidic conditions.

8. The cyanobacterium of claim 1, wherein extracellular glucose is exuded from cells or released from extracellular polysaccharides by the actions of one or more endogenous secreted glycosyl hydrolases.

9. An isolated cyanobacterium, comprising:

a *Synechococcus* sp. comprising a portion of an exogenous bacterial cellulose operon sufficient to express bacterial cellulose, whereby the cyanobacterium is capable of producing extracellular monosaccharides, disaccharides, oligosaccharides or polysaccharides comprising glucose.

10. The cyanobacterium of claim 9, wherein the cyanobacteria is further defined as producing extracellular glucose in the form of monosaccharides, disaccharides, oligosaccharides or polysaccharides from photosynthesis.

11. The cyanobacterium of claim 9, wherein the cyanobacterium is further defined as making monosaccharides, disaccharides, oligosaccharides or polysaccharides that comprise glucose and cellulose.

12. The cyanobacterium of claim 9, wherein the cyanobacterium comprises *Synechococcus* sp. PCC 7002, *Synechococcus leopoliensis* strain UTCC 100, *Agmenellum quadruplicatum* UTEX B2268, *Nostoc* spp., *Anabaena* spp., *Cyanothece* spp., *Trichodesmium* spp., and *Synechococcus* sp. ATCC 27264.

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13. The cyanobacterium of claim 9, wherein the cellulose, the cyanobacterial extracellular polysaccharides or both are further processed as a renewable feedstock for biofuel production.

14. The cyanobacterium of claim 9, wherein extracellular glucose is exuded from cells or released from extracellular polysaccharides by the actions of one or more endogenous secreted glycosyl hydrolases.

15. A method of producing monosaccharides, disaccharides, oligosaccharides or polysaccharides comprising glucose, comprising:

modifying a cyanobacterium with a portion of an exogenous bacterial cellulose operon sufficient to express and produce extracellular glucose;

growing the cyanobacteria under conditions that promote extracellular glucose production; and

exposing the cyanobacteria to an acidic condition, wherein the acid increases extracellular glucose production and optionally that the viable cells are returned to the growth medium after glucose harvest for continued production of cells, biomass, cellulose or glucose.

16. The method of claim 15, further comprising the step of processing the glucose into ethanol.

17. The method of claim 15, wherein the glucose is used as a renewable feedstock for biofuel production.

18. The method of claim 15, wherein the cyanobacterium fixes CO₂ and thus atmospheric CO₂.

19. The method of claim 15, wherein the glucose is used as a renewable feedstock for animals.

20. A method of fixing carbon into a photobiomass comprising:

growing a cyanobacterium comprising a portion of an exogenous bacterial cellulose operon sufficient to make cellulose and to produce extracellular glucose in a CO₂-containing growth medium;

generating glucose with said cyanobacterium, wherein CO₂ is fixed into glucose at a level higher than an unmodified cyanobacterium; and

calculating the amount of CO₂ fixed into the glucose to equate to one or more carbon credit units.

21. The method of claim 20, wherein at least one other carbon is fixed into glucose and at least one other carbon's is equated to carbon credit units that is included in the calculation.

22. An isolated cyanobacterium comprising a portion of an exogenous bacterial cellulose operon sufficient to express bacterial cellulose, whereby the cyanobacterium is capable of producing extracellular monosaccharides, disaccharides, oligosaccharides or polysaccharides.

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